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PATENT

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte Cary Lee Bates, Paul Reuben Day, John Matthew Santosuosso

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Appeal No. _____
Application No. 09/356,241

SUPPLEMENTAL APPEAL BRIEF

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Cary Lee Bates et al.	Art Unit:	2172
Serial No.:	09/356,241	Examiner:	Cam-Y Truong
Filed:	July 16, 1999	Atty. Docket No.:	IBM/96

For: ORDERING OF DATABASE SEARCH RESULTS BASED ON USER FEEDBACK

Assistant Commissioner for Patents
ATTENTION: Board of Patent Appeals and Interferences
Washington, D.C. 20231

SUPPLEMENTAL APPEAL BRIEF

I. REAL PARTY IN INTEREST

This application is assigned to International Business Machines Corporation, of Armonk, New York.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

The Application was originally filed with 47 claims, with claims 28-37 and 39-47 being canceled in the Preliminary Amendment filed on July 16, 1999 concurrently with the Application. Additional claims corresponding to the originally canceled claims 28-37 and 39-47 were added as claims 48-66 in the Amendment and Response filed on July 9, 2001(Paper 5). Of these claims, claims 59-63 were objected to by the Examiner in the non-final Office Action mailed May 10, 2002 (Paper 9) in response to Applicants' Appeal Brief filed on February 27, 2002 (Paper 8), with the remainder of the claims (claims 1-27, 38 and 48-66) being rejected by the Examiner. As noted in Section IV below, claims 38, 64 and 65 have been amended to incorporate the subject matter of objected-to claim 59, and as such, the rejections of claims 38,

58 and 64-66 should be withdrawn. Therefore, assuming entry of the accompanying amendments, claims 1-27 and 48-57 should remain rejected, and the subject of appeal.

IV. STATUS OF AMENDMENTS

An amendment has been submitted herewith to incorporate the subject matter of objected-to claim 59 into each of claims 38, 64 and 65. Given that the Office Action of May 10, 2002 was non-final (but the second rejection of the claims on appeal), Applicants assume that the amendment will be entered as a matter of right. Moreover, in view of the Examiner's finding that claim 59 is directed to patentable subject matter, it is respectfully submitted that allowance of the previously-rejected claims 38 and 64-66 should be forthcoming, and that the Examiner's previous rejections of these claims should be withdrawn. This Appeal Brief is drafted under the assumption that the Examiner's rejections of claims 38, 58 and 64-66 have been rendered moot, and to the extent necessary under Office procedures, Applicants respectfully request that the rejections of these claims be withdrawn.

V. SUMMARY OF INVENTION

The claims at issue are generally directed to a number of improvements in the area of database searching, and in particular, in search engines used to retrieve search results (referred to as "result sets") from one or more databases. Some search engines may find utility, for example, in assisting users with locating relevant information from the Internet. For instance, Yahoo, Google, AltaVista, Hotbot, and Excite are examples of well known search engines.

In the context of Internet searching, search engines are typically used to identify Internet-accessible documents that match a certain search criterion, e.g., one or more keywords input by a user. However, given that words can have different meanings in different contexts, and that the volume of information accessible via the Internet is enormous and growing larger every day, often a search engine will identify a large number of potentially relevant documents in response to a search. When a large number of documents are identified, the manner in which those documents is presented to a user becomes as, if not more, important than the process of finding those documents in the first place.

The ultimate goal of a search engine is to present a user with requested information in such a manner that as little additional effort as possible is required on the part of the user. As such, it is typically desirable for a search engine to "rank" search results in such a manner that the potentially most relevant documents will be presented to a user first, e.g., in a list where each successive document in the list is somewhat less relevant than every document listed above that document in the list. The fewer documents a user is required to look at to find requested information, the less burden is placed on the user.

Early search engines typically relied on generally rudimentary retrieval algorithms that ranked the results of queries based upon factors such as the number of search terms that were found in each document, the number of occurrences of each search term in each document, the proximity of search terms in each document, and/or the location of search terms in each document (e.g., giving greater weight to search terms being at the top, or in a title or heading, or a document). (Application, page 2).

Later search engines incorporated other factors into result rankings. For example, some search engines rank documents that are listed in various Internet directories over other documents that are not. Still other search engines use "link popularity," where documents are ranked in part based upon the number of links to those documents by other documents. The theory in this latter instance is that a document that is referenced by a large number of other documents will typically contain more useful information (Application, page 2).

Yet another factor that may be used in ranking search results is based upon user interaction with documents. For example, it is possible with some search engines to monitor the amount of time that a user spends viewing particular documents identified in a set of search results and increase the ranks of documents that have been viewed for longer times, based upon the premise that a user will spend more time viewing a more relevant document than viewing a less relevant document. (Application, page 3). However, it has been found that the duration that a user spends viewing a document can also be dependent upon factors other than relevancy, e.g., if a document is large and the user has to spend a relatively long amount of time to determine that the document is not relevant. As a consequence, it has been found that the duration that a user

spends viewing a document may have only marginal applicability to the relevance of a document in certain instances. (Application, page 3).

Many of Applicants' claims discussed below are directed to enhancements in terms of utilizing user feedback in ranking search results. In particular, a "user feedback parameter" is associated with records in a database, and is used to order records that have been placed in a result set generated in response to a search request. (Application, page 4).

As a component of utilizing user feedback parameters in ranking search results, two principal operations are typically required. The first such operation is that of generating search results in response to user requests. It is during the generation of search results that user feedback parameters are typically used to rank results. (Application, page 13). Moreover, as discussed in greater detail at pages 12-13, typically user feedback parameters will be used in connection with other factors to rank search results. For example, keyword-based relevance may be used as a primary sort key, with user feedback parameters used as secondary sort keys to rank records having the same or similar keyword-based relevance.

The second operation is that of tracking user interaction with records after a result set has been generated, so that user feedback data can be associated with particular records for use in ordering future generated result sets. (Application, page 13).

One user interaction that Applicants have identified as having a potential effect on the perceived relevance of a record is that of *multiple* accesses to a record by a user, the theory being that a single access to a record listed in a result set is not nearly as indicative of the relevance of a record as multiple accesses to that same record. (Application, page 4). It is likely in many instances that, when presented with a list of search results, a user may quickly look over numerous records to identify potentially relevant information. However, only later will the user return to particular records that have been identified as being more relevant than the other records in the result set. Thus, detecting multiple accesses to a particular record has somewhat of the effect of filtering out a user's first pass through a set of search results. Furthermore, it is believed that the more times a user revisits a particular record, the more likely that the record contains useful information, as a user would be less likely to revisit a worthless record.

As an example, a user might be presented with records A, B, C and D, and might quickly access each record to ascertain its potential relevancy. Assuming that the user found that record B was the most likely source of useful information, that user might be inclined to revisit record B and read the record in more detail. The fact that record B was accessed multiple times thus indicates a higher potential relevancy for record B than the other records in the result set.

Another user interaction that Applicants have identified as having a potential effect on the perceived relevance of a record is that of a record being the last, or most recently, accessed record from a result set, the theory being that a user will typically halt looking through search results once the desired information is found. (Application, page 4).

As an example, a user might be presented with the same records A, B, C and D, and might view records A and B, and notice that the information he or she was seeking is not present in those records. Then, if the user viewed record C, and found the desired information, that user would likely not go on to view record D, or revisit either of records A or B. The fact that record C was the most recently accessed record from the result set thus indicates a higher potential relevancy for record C than the other records in the result set.

Another user interaction that Applicants have identified as having a potential effect on the perceived relevance of a record is based upon the *context* within which a user accesses particular records. (Application, page 4). This is premised upon the belief that certain records may be accessed for different reasons, some of which may or may not be relevant when a record is being ranked in a result set based upon a particular search request. To address contextual relevancy of a record, Applicants have proposed to associate, with a user feedback parameter for a record, a plurality of weights, each of which associated with a particular keyword. Then, when the relevancy of a record is being analyzed during ranking of a record in a result set, only those weights that are associated with keywords that match the search request from which the result set is generated are used in the analysis. A detailed example of an embodiment that implements such context-based weighting is described in the Application at pages 23-25, and shown in Figs. 13-15.

An additional feature that is recited in the claims is that of grouping results into relevance groups, and utilizing user feedback parameters to sort the results in each of the relevance groups.

As described, for example, at page 13 of the Application, a relevance group may be defined to include records from a result set that have an identical relevancy, or a relevancy within a predetermined range. User feedback information in this circumstance is used as a secondary ordering parameter to sort the records within the individual groups.

Still another feature recited in the claims is the use of script-based notification to generate the user feedback information ultimately used in the ranking of later search results. As described at pages 16, 18 and 19 of the Application, and shown in Fig. 8 and Table I, it may be desirable to embed executable scripts in a result document returned to a user. As is well known in the art, it is often commonplace to return search results in Internet searches in the form of result pages where the results are listed with embedded hypertext links that a user can select to view the specific results. Applicants have proposed, however, to utilize embedded scripts in lieu of such hypertext links to provide, in addition to the function of navigating the identified record, the additional function of sending a notification to a search engine that a user is selecting that particular record.

One benefit of this configuration is that, in many instances, a conventional Internet browser may be used by a user to access search results, and to provide feedback to a search engine, without any specific modifications or customized software installed by the user. Moreover, the act of notifying the search engine is more or less "invisible" to the user, as the user is often able to access a record using the same input from that user's perspective.

A further feature recited in the claims is that of using a search request data structure to store previously-generated result sets. In particular, a search request data structure is utilized to store a plurality of search request records, with each including a search request identifier that identifies a unique combination of keywords, and a result set identifier that identifies a subset of a plurality of records in a database that match the unique combination of keywords. The search request data structure is accessed in response to a search request to locate a search request record including a search request identifier that matches the keywords provided in the search request. A result set is then generated that identifies the subset of records identified in the result set identifier in the located search request record. (Application, page 4).

Among other advantages, the use of a search request data structure permits optimal result sets to be associated with particular search requests, such that future instances of the same search requests can return the same result sets in lieu of attempting to construct new result sets from scratch. (Application, page 4). A more detailed discussion of one exemplary embodiment that implements such a search request data structure is found at pages 25-28 of the Application, and shown in Figs. 16-19.

VI. ISSUE

Whether claims 1-27 and 48-56 were improperly rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,855,015 to Shoham (hereinafter, "*Shoham*") in view of U.S. Patent No. 5,724,567 to Rose et al. (hereinafter, "*Rose*").

VII. GROUPING OF CLAIMS

Claims 1-27 and 48-56 do not stand or fall together.

VIII. ARGUMENT

Claims 1-27 and 48-56 were rejected on the basis of 35 U.S.C. §103(a) as being obvious in view of *Shoham* and *Rose*[1]. A *prima facie* showing of obviousness, however, requires that the Examiner establish that the differences between a claimed invention and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. §103(a). Moreover, such a showing requires objective evidence of the suggestion, teaching or motivation to combine prior art references, as "[c]ombining prior art references without evidence of such a suggestion, teaching or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability -- the essence of hindsight." In re Dembiczak, 50 U.S.P.Q. 2d 1614, 1617 (Fed. Cir. 1999).

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[1]It should be noted that claim 57, which depends from claim 56, is not addressed by the Examiner in the Office Action of May 10, 2002. However, Applicants have chosen to not argue the patentability of this claim separately from claim 56.

Applicants respectfully submit that *Shoham* and *Rose* do not disclose or suggest, alone or in combination, the various features recited in claims 1-27 and 48-56, and as such, the rejections thereof should be reversed. Applicants will first address the various independent claims that are the subject of the Examiner's rejection, followed by several of the dependent claims.

Independent Claims

Claim 1

Claim 1 recites a method of accessing a database, which includes, *inter alia*, ordering the identifications of records from a result set using a user feedback parameter associated with each record in the result set, and, for each of the plurality of records, selectively updating the user feedback parameter associated therewith in response to detecting multiple accesses thereto by a user. As discussed above in Section V, Applicants have discovered that in many cases, a user's selection and viewing of a record multiple times will indicate a higher degree of relevancy within the context of a result set.

The Examiner admits, at page 3 of the Office Action of May 10, 2002, that *Shoham* fails to teach selectively updating a user feedback parameter associated with a record in response to detecting multiple access thereto by a user. However, the Examiner relies on *Rose* for allegedly teaching this feature of Applicants' invention, citing the passages at col. 4, lines 25-60, col. 5, lines 20-60, and col. 6, lines 30-35.

None of the cited passages, however, disclose updating a user feedback parameter specifically "in response to" detection of multiple accesses to a record by a user. Instead, *Rose* discloses, at col. 5, lines 18-59, that a user may be prompted to indicate interest in a retrieved message via either a combination of "thumbs-up" and "thumbs-down" buttons, or at a finer granularity such as through a combination of three buttons indicating "high interest, mediocre interest, or minimal interest." However, there does not appear to be any tracking of multiple accesses by a user in *Rose*, so Applicants fail to appreciate the relevance of this reference.

Rose does disclose updating a "user profile" based upon a user's relative interest in a message. For example, at col. 6, lines 28-36, *Rose* discloses that a user profile can include a vector of terms, and that the vector can be modified so as to increase the weight of all of the

significant terms in a document in that user's profile in response to a user indicating an interest in that document.

However, this disclosure in *Rose* falls far short of disclosing or suggesting updating a user feedback parameter associated with a record in response to detecting multiple accesses to the record by a user.

In particular, there is no disclosure in *Rose* as to detecting multiple accesses to a record by a particular user. Such detection would require, in the least, that some mechanism be provided so that, when a record is accessed by a user, it could be determined whether the record had already been accessed by that same user. *Rose* neither discloses nor suggests any such mechanism.

It appears from the Examiner's citation of col. 6, lines 30-35, that the Examiner may be taking the position that the passage "[e]ach time a user provides a new response to a retrieved message, the profile vector is modified in accordance with the results of the indication" (Col. 6; lines 31-33) somehow suggests that multiple accesses to a message could be logged as user feedback. However, it is important to note that this cited passage deals with updating a user profile, which is associated not with any particular record or document, but with a particular user. Claim 1, on the other hand, updates a user feedback parameter associated with a record, and not with a particular user. As such, this passage in *Rose* does not support the Examiner's argument.

More specifically, as discussed at col. 6, lines 4-27, *Rose* discloses creating vectors for documents that include various weights for the significant terms that are present in the documents. For users, user profile vectors are created, as discussed at col. 6, lines 28-31. In addition, as discussed at col. 6, lines 52-61, the correlation between a user's interests and a document is made by comparing the similarity of the user's profile vector the document's vector. Nothing in these passages of *Rose*, however, suggests that multiple accesses may be logged to a vector associated with a document or other record.

In another section of *Rose*, starting at col. 6, line 62, it is disclosed that a feedback table may be used to track the interest of a plurality of users for a plurality of documents (see also Fig. 6). However, it should be noted that the disclosed feedback table only records for each (user, document) tuple whether a given user votes favorably (+1), negatively (-1) or not at all (0) for a

particular document (col. 7, lines 27-35). There is no suggestion that multiple accesses to a particular document by a user would be collectively logged in the feedback table. As such, *Rose* does not disclose or suggest updating a user feedback parameter for a record in response to detection of multiple accesses of the record by a user.

It should also be noted that, even if *Rose* did suggest that multiple accesses to a document could be collectively logged, such a suggestion would still fall short of suggesting every feature of claim 1. Claim 1, in particular, recites that a user feedback parameter for a record is updated specifically in response to the detection of multiple accesses. Collectively logging multiple accesses as individual and isolated events, however, is not equivalent to detecting the fact that multiple accesses have occurred, as is recited in claim 1.

As discussed above in Section V. above, Applicants have found that the fact that a user accesses a document multiple times is in itself indicative of the relevancy of that document. Neither *Shoham*, nor *Rose*, appreciates this fact, and as such, neither reference, alone or in combination, suggests Applicants' claimed combination.

Applicants therefore respectfully submit that claim 1 is non-obvious over *Shoham* and *Rose*. Reversal of the Examiner's rejection of claim 1, and of the claims depending therefrom, are therefore respectfully requested.

Claims 11-12

Claims 11 and 12 each recite, *inter alia*, selectively updating a user feedback parameter associated with a record in response to detecting multiple accesses thereto by a user, similar to claim 1. As such, these claims are patentable over *Shoham* and *Rose* for the same reasons as presented above for claim 1. Reversal of the Examiner's rejections, and allowance of these claims, are therefore respectfully requested.

Claim 14

Claim 14 recites a method of accessing a database, which includes, *inter alia*, selectively updating a user feedback parameter associated with a record in response to detecting that the record is the most recently accessed record in a result set. As discussed above in Section V,

Applicants have discovered that, in many cases, a record from a result set that is accessed last (i.e., most recently) will often be more relevant than other records in a result set due to the fact that a good chance exists that a user found the information he or she was looking for when the user accessed that record. Put another way, when a user finds the answer he or she is looking for in a particular document, the user is less likely to continue to look at other documents once the answer is found.

As with claim 1, the Examiner admits that *Shoham* does not teach updating a user feedback parameter based upon whether a record is the most recently accessed record in a result set. However, the Examiner relies on *Rose*, and in particular Col. 4, lines 25-60 and Col. 5, lines 20-60, to allegedly teach this claimed concept.

The passages in *Rose* that are cited by the Examiner, however, are utterly silent as to detecting whether a document is a most recently accessed document in a result set. The passages instead deal with how a list of messages is ranked, and how user feedback is obtained via selection of "thumbs-up" and "thumbs-down" buttons. Nowhere in these passages, or elsewhere in *Rose*, is there any appreciation that the fact that a record is accessed most recently has any particular relevance.

It appears the Examiner is relying somewhat on the disclosure in *Rose* of time and date information associated with messages or documents viewed by a user. However, *Rose* does not use time and/or date in connection with associating user feedback information with a particular message, so Applicants fail to appreciate how this is even relevant to Applicants' claimed concept. If it is the Examiner's position that the simple disclosure of associating a time or date with a message suggests that the relative time of a message can be used in generating user feedback, Applicants submit that such a position would be highly (and improperly) reliant on hindsight.

In addition, it should be noted that *Rose*, like *Shoham*, discloses an active user feedback system whereby a user is required to actively "rate" each document. Actively rating a document, however, is not analogous to updating a user feedback parameter in response to detecting the access order of a record, as is recited in claim 14.

Applicants therefore respectfully submit that claim 14 is non-obvious over *Shoham* and *Rose* based upon the recitation of updating a user feedback parameter based upon a record being the most recently accessed record in a result set. Reversal of the Examiner's rejection of claim 14, and allowance of the claim, are therefore respectfully requested.

Claims 24-25

Claims 24 and 25 each recite, *inter alia*, selectively updating a user feedback parameter associated with a record in response to detecting the record is the most recently accessed record in a result set, similar to claim 14. As such, these claims are patentable over *Shoham* and *Rose* for the same reasons as presented above for claim 14. Reversal of the Examiner's rejections, and allowance of these claims, are therefore respectfully requested.

Claim 27

Claim 27 recites, *inter alia*, the feature of ordering the identifications of records in a result set using a user feedback parameter associated with each record in the result set, where each user feedback parameter includes a plurality of weights, where each weight is associated with a keyword, and where the ordering of identifications uses those weights associated with keywords that match the search request. Claim 27 also recites selectively updating a weight for a user feedback parameter for a record in response to user interaction with that record.

In rejecting claim 27, the Examiner primarily relies on *Shoham*, which is generally directed to the use of heuristics to find potentially interesting information for users. User feedback is then used to modify the heuristics, i.e., to modify the types of information that will be searched and/or presented to a user (col. 7, lines 32-35). The user feedback, however, is provided in the form of "a rating, score, or binary parameter, such as yes/no, good/bad, or the like." (col. 7, lines 28-32). For example, *Shoham* presents an actual implementation where user feedback is implemented through the receipt of "evaluation" values of between +5 and -5, which were actively provided by a user after viewing pages. (col. 12, lines 28-36).

The specific passage relied upon by the Examiner, at Col. 11, lines 15-20, generally discloses creating vector representations of documents based upon keywords and weights.

However, it is important to note that the "weights" for a document in *Shoham* are based upon a TFIDF scheme that is based upon the frequency and positioning of keywords in the document, and not on user feedback. (Col. 11, line 52 to Col. 12, line 3). Instead, user feedback is used to update different weights for a system model for a user, designated by the vector $\vec{M}$ (col. 12, lines 28-36).

Relevancy scores for use in ordering search results are computed by taking the dot product of a document vector $\vec{V}$ and a user model vector $\vec{M}$ (Col. 12, lines 8-14). As such, *Shoham* cannot be read to disclose either that a result set is ordered based upon user feedback parameters associated with each record, or that a particular weight for a record is updated based upon user interaction with a record.

Rose, similar to *Shoham*, relies upon user feedback to update weights for a user profile vector, and not a vector associated with a document. For the document vectors in *Rose*, the weights of keywords are based upon the uniqueness of the words in the language, and the frequency that they appear in a document. (Col. 6, lines 8-15). As such, *Rose* adds nothing to the Examiner's rejection.

Applicants therefore respectfully submit that claim 27 is non-obvious over *Shoham* and *Rose* based upon the recitation of a user feedback parameter for a record having a plurality of weights that are associated with different keywords. Reversal of the Examiner's rejection of claim 27, and allowance of this claim, are therefore respectfully requested.

Claims 55-56

Claims 55 and 56 each recite, *inter alia*, ordering the identifications of records in a result set using a user feedback parameter associated with each record in the result set, where each user feedback parameter includes a piurality of weights, where each weight is associated with a keyword, and where the ordering of identifications uses those weights associated with keywords that match the search request, similar to claim 27. As such, these claims are patentable over *Shoham* and *Rose* for the same reasons as presented above for claim 27. Reversal of the Examiner's rejections, and allowance of these claims, are therefore respectfully requested.

Dependent Claims

Claims 2, 5, 8-9, 13, 15-16, 18, 21-22, 26, 48, 53-54 and 57

Claims 2, 5, 8-9, 13, 15-16, 18, 21-22, 26, 48, 53-54 and 57 are not separately argued.

Claim 3

Claim 3 recites, in addition to claim 1, the step of "increasing a weight for the user feedback parameter associated with a first record in response to the first record being the most recently accessed record in the result set." As discussed above in connection with independent claim 14, this feature is not disclosed or suggested by the combination of *Shoham* and *Rose*. Thus, claim 3 is patentable over *Shoham* and *Rose* for the same reasons presented above for both claims 1 and 14. Reversal of the Examiner's rejection, and allowance of this claim, are therefore respectfully requested.

Claim 4

Claim 4 recites, in addition to claim 1, the feature of ordering the identifications of the records in a result set using a user feedback parameter associated with each record in the result set, where each user feedback parameter includes a plurality of weights, where each weight is associated with a keyword, and where the ordering of identifications uses those weights associated with keywords that match the search request. As discussed above in connection with independent claim 27, this feature is not disclosed or suggested by the combination of *Shoham* and *Rose*. Thus, claim 4 is patentable over *Shoham* and *Rose* for the same reasons presented above for claims 1 and 27. Reversal of the Examiner's rejection, and allowance of this claim, are therefore respectfully requested.

Claim 6

Claim 6 recites, in addition to claim 1, that generating the result set includes accessing a search request data structure that includes a plurality of search request records, each including a search request parameter identifying a unique combination of keywords, and a result set parameter identifying a subset of records in the database that match the unique combination of

keywords. As described in Section V above, by storing result sets for particular search requests, in some instances it may be possible to eliminate the need to generate a result set from scratch in response to a new search request that is similar to one that has previously been performed. In particular, when a search request is received that matches the search request identifier for a particular search request record, the subset of records that is associated with that search request identifier may be used to generate the result set, thus eliminating the need to perform an actual search and build a new result set.

In rejecting claim 6, the Examiner relies on Fig. 1, col. 5, lines 62-67 and col. 6, lines 13-20 of *Shoham*. Fig. 1, however, discloses nothing more than a computer network, with hypertext documents and the links therebetween shown stored in one or more computers on the network. Also, the cited passages of *Shoham* are reproduced below for the Board's convenience:

> "With continuing reference to FIG. 1, each computer on the network may contain information resources, indicated generally by reference numeral 30, having hyperlinks, indicated generally by reference numeral 32, to other information resources. Information resources represent various types of multimedia information, such as text 34, graphics 36, . . ." (*Shoham*, col. 5, lines 62-67).

> "In one embodiment of the present invention, information resources are authored utilizing the HyperText Markup Language (HTML) and the hyperlinks are defined utilizing Uniform Resource Locators (URL's). Also in this embodiment, the HyperText Transfer Protocol (HTTP) is utilized to explore and retrieve the associated information resource specified by the URL as explained in greater detail below." (*Shoham*, col. 6, lines 13-20).

Precisely how the Examiner considers the above passages to apply to the specific limitations of claim 6 is unclear. In fact, it appears that the passages that have been relied upon by the Examiner in rejecting claim 6 are completely irrelevant to the concepts recited in claim 6. Moreover, Applicants can find no disclosure or suggestion in *Shoham* or *Rose* of anything even arguably relevant to the concepts recited in claim 6. Accordingly, Applicants respectfully submit that claim 6 is novel and non-obvious over *Shoham* and *Rose*. Reversal of the Examiner's rejection of claim 6, and allowance of this claim, are respectfully requested.

Claim 7

Claim 7 adds to claim 1, the concept of partitioning a result set into a plurality of relevance groups, and sorting the relevance groups using the weights from user feedback parameters. In rejecting these claims, the Examiner relies on Fig. 4, and col. 8, lines 25-31, of *Shoham*. The relevant text is reproduced below for the Board's convenience:

> "The user may also enter a specific or general query at block 120, or select an information resource of interest to initialize the heuristics. Alternatively, a null query indicates that the system should simply start exploring and use subsequent presentation and relevance feedback to shape the heuristics and determine which information resources to present to the user."

Applicants can find no relevancy whatsoever in this passage to "relevance groups" or any other specific features recited in claim 7. The Examiner's comments at page 8 of the Office Action of May 10, 2002, likewise are silent as to "relevance groups." Moreover, Applicants can find no teaching elsewhere in *Shoham*, or in *Rose*, as to the use of "relevance groups" within the context of the invention.

Applicants therefore respectfully submit that the Examiner has fallen far short of establishing a *prima facie* case of obviousness as to claim 7. Reversal of the Examiner's rejections, and allowance of claim 7, are therefore respectfully requested.

Claim 10

Claim 10 adds to claim 1, the concept of generating a script in a hypertext document that generates a notification configured to indicate that an associated record has been accessed by a user. As discussed in Section V above, by using embedded scripts in a hypertext document, a search engine may be notified of user feedback information simply by virtue of a user's selection of a link to a document in a result set. In many instances, such a configuration may enable a purely conventional browser to be used at the user end, thus eliminating the need for customized software in a user's computer. Moreover, often the use of embedded scripts enables user tracking to be performed without any conscious effort on the part of a user.

In rejecting claim 10, the Examiner admits that *Shoham* fails to teach a script that is configured to generate a notification that the associated record has been accessed by a user, as well as the concept of receiving that notification as a part of detecting multiple accesses to a document. Instead, the Examiner relies on col. 7, lines 35-40 of *Rose* to allegedly disclose this claimed concept.

The cited passage of *Rose*, however, discusses the concept of storing +1, -1 or 0 values in a feedback table to indicate whether a user has or has not voted on a particular document, and if the user has, whether the vote is favorable or negative. In the Examiner's comments at page 11 of the Office Action of May 10, 2002, the Examiner apparently argues that these values are able to distinguish whether a person has voted on a particular document or not, and thus the inclusion of these values somehow constitutes a notification that a document has been accessed by a user.

It is important to note, however, that claim 10 does not merely claim the concept of providing a notification whenever a user accesses a record. Claim 10 is more specifically directed to the use of an embedded script in a hypertext document to achieve such notification.

Both *Shoham* and *Rose* are completely silent as to the use of embedded scripts to perform any analogous function to generating a notification that a user accessed a document. In view of this lack of teaching, the best argument the Examiner attempts to make is that "[t]he system should include a script to generate scores or a notification for each document in order to show the document has been accessed by a user." (Office Action of May 10, 2002, page 9). There is no support for this statement in the references, and indeed, the statement reflects a substantial reliance upon hindsight on the part of the Examiner.

Applicants therefore respectfully submit that claim 10 is additionally patentable over *Shoham* and *Rose* based upon this additional feature. Reversal of the Examiner's rejections, and allowance of this claim, are therefore respectfully requested.

Claim 17

Claim 17 recites, in addition to claim 14, the feature of ordering the records in a result set using a user feedback parameter associated with each record in the result set, where each user feedback parameter includes a plurality of weights, where each weight is associated with a

keyword, and where the ordering of identifications uses those weights associated with keywords that match the search request. As discussed above in connection with independent claim 27, this feature is not disclosed or suggested by the combination of *Shoham* and *Rose*. Thus, claim 17 is patentable over *Shoham* and *Rose* for the same reasons presented above for claims 14 and 27. Reversal of the Examiner's rejection, and allowance of this claim, are therefore respectfully requested.

Claim 19

Claim 19 recites, in addition to claim 14, that generating the result set includes accessing a search request data structure that includes a plurality of search request records, each including a search request parameter identifying a unique combination of keywords, and a result set parameter identifying a subset of records in the database that match the unique combination of keywords. As discussed above in connection with claim 6, this feature is not disclosed or suggested by the combination of *Shoham* and *Rose*. Thus, claim 19 is patentable over *Shoham* and *Rose* for the same reasons presented above for claims 14 and 6. Reversal of the Examiner's rejection, and allowance of this claim, are therefore respectfully requested.

Claim 20

Claim 20 adds to claim 14, the concept of partitioning a result set into a plurality of relevance groups, and sorting the relevance groups using the weights from user feedback parameters. As discussed above in connection with claim 7, this feature is not disclosed or suggested by the combination of *Shoham* and *Rose*. Thus, claim 20 is patentable over *Shoham* and *Rose* for the same reasons presented above for claims 14 and 7. Reversal of the Examiner's rejection, and allowance of this claim, are therefore respectfully requested.

Claim 23

Claim 23 adds to claim 14, the concept of generating a script in a hypertext document that generates a notification configured to indicate that an associated record has been accessed by a user. As discussed above in connection with claim 10, this feature is not disclosed or suggested

by the combination of *Shoham* and *Rose*. Thus, claim 23 is patentable over *Shoham* and *Rose* for the same reasons presented above for claims 14 and 10. Reversal of the Examiner's rejection, and allowance of this claim, are therefore respectfully requested.

Claim 49

Claim 49 recites, in addition to claim 27, increasing a weight for a user feedback parameter associated with a first record in response to detecting multiple accesses thereto by a user. As discussed above in connection with independent claim 1, this feature is not disclosed or suggested by the combination of *Shoham* and *Rose*. Thus, claim 49 is patentable over *Shoham* and *Rose* for the same reasons presented above for both claims 1 and 27. Reversal of the Examiner's rejection, and allowance of this claim, are therefore respectfully requested.

Claim 50

Claim 50 recites, in addition to claim 27, increasing a weight for a user feedback parameter associated with a first record in response to the first record being the most recently accessed record in a result set. As discussed above in connection with independent claim 14, this feature is not disclosed or suggested by the combination of *Shoham* and *Rose*. Thus, claim 50 is patentable over *Shoham* and *Rose* for the same reasons presented above for both claims 14 and 27. Reversal of the Examiner's rejection, and allowance of this claim, are therefore respectfully requested.

Claim 51

Claim 51 recites, in addition to claim 27, that generating the result set includes accessing a search request data structure that includes a plurality of search request records, each including a search request parameter identifying a unique combination of keywords, and a result set parameter identifying a subset of records in the database that match the unique combination of keywords. As discussed above in connection with claim 6, this feature is not disclosed or suggested by the combination of *Shoham* and *Rose*. Thus, claim 51 is patentable over *Shoham*

and *Rose* for the same reasons presented above for claims 6 and 27. Reversal of the Examiner's rejection, and allowance of this claim, are therefore respectfully requested.

Claim 52

Claim 52 adds to claim 27, the concept of partitioning a result set into a plurality of relevance groups, and sorting the relevance groups using the weights from user feedback parameters. As discussed above in connection with claim 7, this feature is not disclosed or suggested by the combination of *Shoham* and *Rose*. Thus, claim 52 is patentable over *Shoham* and *Rose* for the same reasons presented above for claims 7 and 27. Reversal of the Examiner's rejection, and allowance of this claim, are therefore respectfully requested.

IX. CONCLUSION

In conclusion, Applicants respectfully request that the Board reverse the Examiner's rejections, and that the Application be passed to issue. If there are any questions regarding the foregoing, please contact the undersigned at 513/241-2324. Moreover, if any other charges or credits are necessary to complete this communication, please apply them to Deposit Account 23-3000.

Respectfully submitted,

WOOD, HERRON & EVANS, L.L.P.

Date: 9 AUG 2002

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APPENDIX A: CLAIMS ON APPEAL (S/N 09/356,241)

(prior to entry of August 9, 2002 Amendment)

1. A method of accessing a database, the method comprising:

(a) in response to a search request, generating a result set including identifications of a subset of a plurality of records in a database that match the search request;

(b) ordering the identifications of the records in the result set using a user feedback parameter associated with each record in the result set; and

(c) for each of the plurality of records, selectively updating the user feedback parameter associated therewith in response to detecting multiple accesses thereto by a user.

2. The method of claim 1, wherein selectively updating the user feedback parameter includes increasing a weight for the user feedback parameter associated with a first record in response to the number of times a user accesses the first record.

3. The method of claim 1, further comprising increasing a weight for the user feedback parameter associated with a first record in response to the first record being the most recently accessed record in the result set.

4. The method of claim 1, wherein the user feedback parameter associated with each record includes a plurality of weights, each weight associated with a keyword in the associated record, and wherein ordering the records in the result set using the user feedback parameter associated with each record in the result set includes ordering the records using any weight associated with a keyword matching the search request.

5. The method of claim 4, wherein selectively updating the user feedback parameter includes increasing a first weight for the user feedback parameter associated with a first record in response to receipt of a search request matching a first keyword associated with the first weight.

6. The method of claim 1, wherein generating the result set includes accessing a search request data structure that includes a plurality of search request records, each including a search request parameter identifying a unique combination of keywords, and a result set parameter identifying a subset of records in the database that match the unique combination of keywords.

7. The method of claim 1, wherein ordering the identifications of the records in the result set using the user feedback parameter associated with each record in the result set includes:

(a) partitioning the result set into a plurality of relevance groups, with each relevance group including identifications of records having like relevancies to the search request; and

(b) sorting the identifications of records within each relevance group according to the user feedback parameters associated therewith.

8. The method of claim 1, wherein each record in the database includes a Uniform Resource Identifier (URL) that identifies a document stored on a computer network, wherein selectively updating the user feedback parameter includes selectively updating the user feedback parameter associated with a first record in the database in response to detecting multiple accesses to the document stored at the URL associated with the first record.

9. The method of claim 8, wherein generating the result set includes generating at least one hypertext document including a plurality of hypertext links, each of which configured to access a document identified by a record in the result set.

10. The method of claim 9, wherein generating the hypertext document includes generating a script associated with at least one of the records in the result set, the script configured to generate a notification that the associated record has been accessed by a user, and wherein detecting multiple accesses to the document stored at the URL associated with the first record includes receiving the notification.

11. An apparatus, comprising:

(a) a memory within which is resident a plurality of records from a database, each record associated with a user feedback parameter;

(b) a first program, resident in the memory, the first program configured to, in response to a search request, generate a result set including identifications of a subset of the plurality of records that match the search request, and to order the identifications of the records in the result set using the user feedback parameter associated with each record in the result set; and

(c) a second program, resident in the memory, the second program configured to, for each of the plurality of records, selectively update the user feedback parameter associated therewith in response to multiple accesses thereto by a user.

12. A program product, comprising:

(a) a first program configured to, in response to a search request, generate a result set including identifications of a subset of a plurality of records in a database that match the search request, and to order the identifications of the records in the result set using a user feedback parameter associated with each record in the result set;

(b) a second program configured to, for each of the plurality of records, selectively update the user feedback parameter associated therewith in response to multiple accesses thereto by a user; and

(c) a signal bearing medium bearing the first and second programs.

13. The program product of claim 12, wherein the signal bearing medium includes at least one of a recordable medium and a transmission type medium.

14. A method of accessing a database, the method comprising:

(a) in response to a search request, generating a result set including identifications of a subset of a plurality of records in a database that match the search request;

(b) ordering the identifications of the records in the result set using a user feedback parameter associated with each record in the result set; and

(c) for each of the plurality of records in the database, selectively updating the user feedback parameter associated therewith in response to detecting that the record is the most recently accessed record in the result set.

15. The method of claim 14, wherein selectively updating the user feedback parameter includes increasing a weight for the user feedback parameter associated with a first record in response to the first record being the most recently accessed record in the result set.

16. The method of claim 14, further comprising increasing a weight for the user feedback parameter associated with a first record in response to the number of times a user accesses the first record.

17. The method of claim 14, wherein the user feedback parameter associated with each record includes a plurality of weights, each weight associated with a keyword in the associated record, and wherein ordering the records in the result set using the user feedback parameter associated with each record in the result set includes ordering the records using any weight associated with a keyword matching the search request.

18. The method of claim 17, wherein selectively updating the user feedback parameter includes increasing a first weight for the user feedback parameter associated with a first record in response to receipt of a search request matching a first keyword associated with the first weight.

19. The method of claim 14, wherein generating the result set includes accessing a search request data structure that includes a plurality of search request records, each including a search request parameter identifying a unique combination of keywords, and a result set parameter identifying a subset of records in the database that match the unique combination of keywords.

20. The method of claim 14, wherein ordering the identifications of the records in the result set using the user feedback parameter associated with each record in the result set includes:

(a) partitioning the result set into a plurality of relevance groups, with each relevance group including identifications of records having like relevancies to the search request; and

(b) sorting the identifications of records within each relevance group according to the user feedback parameters associated therewith.

21. The method of claim 14, wherein each record in the database includes a Uniform Resource Identifier (URL) that identifies a document stored on a computer network, wherein selectively updating the user feedback parameter includes selectively updating the user feedback parameter associated with a first record in the database in response to detecting that the document stored at the URL associated with the first record is the most recently accessed document identified in the result set.

22. The method of claim 21, wherein generating the result set includes generating at least one hypertext document including a plurality of hypertext links, each of which configured to access a document identified by a record in the result set.

23. The method of claim 22, wherein generating the hypertext document includes generating a script associated with at least one of the records in the result set, the script configured to generate a notification of when the associated record was accessed by a user, and wherein detecting that the document stored at the URL associated with the first record is the most recently accessed document identified in the result set includes receiving the notification.

24. An apparatus, comprising:

(a) a memory within which is resident a plurality of records from a database, each record associated with a user feedback parameter;

(b) a first program, resident in the memory, the first program configured to, in response to a search request, generate a result set including identifications of a subset of the plurality of records that match the search request, and to order the identifications of

the records in the result set using the user feedback parameter associated with each record in the result set; and

(c) a second program, resident in the memory, the second program configured to, for each of the plurality of records, selectively update the user feedback parameter associated therewith in response to detecting that the record is the most recently accessed record in the result set.

25. A program product, comprising:

(a) a first program configured to, in response to a search request, generate a result set including identifications of a subset of a plurality of records in a database that match the search request, and to order the identifications of the records in the result set using a user feedback parameter associated with each record in the result set;

(b) a second program configured to, for each of the plurality of records, selectively update the user feedback parameter associated therewith in response to detecting that the record is the most recently accessed record in the result set; and

(c) a signal bearing medium bearing the first and second programs.

26. The program product of claim 25, wherein the signal bearing medium includes at least one of a recordable medium and a transmission type medium.

27. A method of accessing a database, the method comprising:

(a) in response to a search request, generating a result set including identifications of a subset of a plurality of records in a database that match the search request;

(b) ordering the identifications of the records in the result set using a user feedback parameter associated with each record in the result set, each user feedback parameter including a plurality of weights, each weight associated with a keyword, wherein ordering the identifications of the records includes using only those weights associated with keywords that match the search request; and

(c) for each of the plurality of records in the database, selectively updating at least one weight for the user feedback parameter associated therewith in response to user interaction with the record.

28. - 37. (CANCELED)

38. A method of processing search requests submitted to a search engine, the method comprising:

(a) receiving a search request that specifies a plurality of keywords;

(b) accessing a search request data structure in response to the search request, the search request data structure including a plurality of search request records, each search request record including a search request identifier identifying a unique combination of keywords, and a result set identifier identifying a subset of a plurality of records in a database that match the unique combination of keywords, wherein accessing the search request data structure includes searching the search request data structure to locate a search request record including a search request identifier that matches the plurality of keywords in the search request; and

(c) generating a result set identifying the subset of records identified in the result set identifier in the located search request record.

39. - 47. (CANCELED)

48. (ADDED) The method of claim 27, wherein selectively updating at least one weight for the user feedback parameter includes, in response to user interaction with a first record, increasing any weight associated with the first record that is further associated with a keyword matching an active search request for the user.

49. (ADDED) The method of claim 27, wherein selectively updating at least one weight for the user feedback parameter includes increasing a first weight for the user feedback parameter associated with a first record in response to detecting multiple accesses thereto by a user.

50. (ADDED) The method of claim 27, wherein selectively updating at least one weight for the user feedback parameter includes increasing a first weight for the user feedback parameter associated with a first record in response to the first record being the most recently accessed record in the result set.

51. (ADDED) The method of claim 27, wherein generating the result set includes accessing a search request data structure that includes a plurality of search request records, each including a search request parameter identifying a unique combination of keywords, and a result set parameter identifying a subset of records in the database that match the unique combination of keywords.

52. (ADDED) The method of claim 27, wherein ordering the identifications of the records in the result set using the user feedback parameter associated with each record in the result set includes:

(a) partitioning the result set into a plurality of relevance groups, with each relevance group including identifications of records having like relevancies to the search request; and

(b) sorting the identifications of records within each relevance group using the weights from the user feedback parameters associated therewith.

53. (ADDED) The method of claim 27, wherein each record in the database includes a Uniform Resource Identifier (URL) that identifies a document stored on a computer network, wherein selectively updating the user feedback parameter includes selectively updating at least one weight for the user feedback parameter associated with a first record in the database in response to user interaction with the first record.

54. (ADDED) The method of claim 33, wherein generating the result set includes generating at least one hypertext document including a plurality of hypertext links, each of which configured to access a document identified by a record in the result set.

55. (ADDED) An apparatus, comprising:

(a) a memory within which is resident a plurality of records from a database, each record associated with a user feedback parameter;

(b) a first program, resident in the memory, the first program configured to, in response to a search request, generate a result set including identifications of a subset of the plurality of records that match the search request, and to order the identifications of the records in the result set using the user feedback parameter associated with each record in the result set, wherein each user feedback parameter includes a plurality of weights, wherein each weight is associated with a keyword, and wherein the first program is configured to order the identifications of the records by using only those weights associated with keywords that match the search request; and

(c) a second program, resident in the memory, the second program configured to, for each of the plurality of records, selectively update the user feedback parameter associated therewith in response to user interaction with the record.

56. (ADDED) A program product, comprising:

(a) a first program configured to, in response to a search request, generate a result set including identifications of a subset of a plurality of records in a database that match the search request, and to order the identifications of the records in the result set using a user feedback parameter associated with each record in the result set, wherein each user feedback parameter includes a plurality of weights, wherein each weight is associated with a keyword, and wherein the first program is configured to order the identifications of the records by using only those weights associated with keywords that match the search request;

(b) a second program configured to, for each of the plurality of records, selectively update the user feedback parameter associated therewith in response to user interaction with the record; and

(c) a signal bearing medium bearing the first and second programs.

57. (ADDED) The program product of claim 56, wherein the signal bearing medium includes at least one of a recordable medium and a transmission type medium.

58. (ADDED) The method of claim 38, further comprising:

(a) for each of the plurality of records in the database, selectively updating a user feedback parameter associated therewith in response to user interaction with the record; and

(b) ordering the identifications of the subset of records in the result set using the user feedback parameter associated with each record in the result set.

59. (ADDED) The method of claim 58, wherein the result set identifier for each search request record further includes a copy of the user feedback parameter for each of the subset of records identified thereby, and wherein selectively updating the user feedback parameter includes updating each copy of the user feedback parameter in the search request data structure.

60. (ADDED) The method of claim 59, wherein the result set identifier for each search request record further includes a list of record identifiers, each of which identifying a record in the associated subset of records, and each of which associated with the copy of the user feedback parameter for the associated record, the method further comprising ordering the list of record identifiers identified by the result set identifier of a first search request record based upon the copies of the user feedback parameters associated with the subset of records.

61. (ADDED) The method of claim 60, wherein the search request data structure comprises a table, wherein each search request record comprises an entry in the table, and

wherein the result set identifier for each search request record comprises a linked list of record identifiers.

62. (ADDED) The method of claim 61, further comprising sorting the table entries responsive to frequency of access thereto.

63. (ADDED) The method of claim 62, further comprising:

(a) adding a new entry to the table in response to receiving a search request not matching any existing entry in the table; and

(b) removing an entry from the table in response to a frequency of access therefor falling below a predetermined threshold.

64. (ADDED) An apparatus, comprising:

(a) a memory within which is resident a search request data structure, the search request data structure including a plurality of search request records, each search request record including a search request identifier identifying a unique combination of keywords, and a result set identifier identifying a subset of a plurality of records in a database that match the unique combination of keywords;

(a) a program, resident in the memory, the program configured to, in response to a search request that specifies a plurality of keywords, search the search request data structure to locate a search request record including a search request identifier that matches the plurality of keywords in the search request, and to generate a result set identifying the subset of records identified in the result set identifier in the located search request record.

65. (ADDED) A program product, comprising:

(a) a memory within which is resident a search request data structure, ;

(a) a program configured to, in response to a search request that specifies a plurality of keywords, search a search request data structure to locate a search request

record including a search request identifier that matches the plurality of keywords in the search request, the search request data structure including a plurality of search request records, each search request record including a search request identifier identifying a unique combination of keywords, and a result set identifier identifying a subset of a plurality of records in a database that match the unique combination of keywords, and the program further configured to generate a result set identifying the subset of records identified in the result set identifier in the located search request record.

66. (ADDED) The program product of claim 65, wherein the signal bearing medium includes at least one of a recordable medium and a transmission type medium.